

Unit 2: Operations and Algebraic Thinking: The Relationship Between Multiplication

In this unit students will engage in leveled problem-solving sets, games, and other visual/kinesthetic activities to develop and build meaning for the properties and operations of multiplication and division. In this unit, students will cement their facility with basic multiplication and division facts by modeling, representing, and explaining solutions as they explore contextual situations.

Important: Students should continue working with the array cards, 100 charts, and flashcards to learn multiplication and division facts. Remember if they know the multiplication fact, make sure they can say the corresponding division fact.

<http://nces.ed.gov/nceskids/index.asp>

MULTIPLICATION AND DIVISION ARE INVERSE OPERATIONS. THEY NEED TO BE TAUGHT TOGETHER AS STUDENTS EXPLORE ARRAYS AND WORK THROUGH THESE LESSONS.

When students discuss, help them use appropriate mathematical vocabulary as they explain and make observations. Use all problem types to help students develop understanding of how to use the operations of multiplication and division. Students need to discuss and compare strategies and models when explaining solutions. Models to use include: interlocking cubes, color tiles, hundreds charts, base 10 blocks, and number lines.

(The number line is a linear model to deepen students understanding of skip-counting, equal groups, and repeated addition. Skip count using numbers 2-10 Compare the tools. Connect number line tool to 100 charts. How are they alike and different?)

Students need to use the array cards and skip-counting charts to learn their multiplication/division facts.

This is the age when they are most interested! Embed commutative property, number theory, transformations, and vocabulary when working with cards. USE THESE ALL YEAR!!

In this unit, students will:

- begin to understand the concepts of multiplication and division
- learn the basic facts of multiplication and their related division facts

Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size.

Some common misconceptions that students may have are thinking a symbol ($?$ or \square) is always the place for the answer. This is especially true when the problem is written as $15 \div 3 = ?$ or $15 = \square \times 3$. Students also think that $3 \div 15 = 5$ and $15 \div 3 = 5$ are the same equations. The use of models is essential in helping students eliminate this understanding.

Another key misconception is that the use of a symbol to represent a number once cannot be used to represent another number in a different problem/situation. Presenting students with multiple situations in which they select the symbol and explain what it represents will counter this misconception.

*adapted from Georgia Department of Education